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ABSTRACT

Information on health occupations educational programs in Ohio and current and projected employment needs for health professionals are presented. The following health fields are examined: allied health, dentistry, emergency medical service, nursing, optometry, pharmacy, podiatry, and veterinary medicine. Issues and trends affecting each field are identified, and attention is directed to the supply of graduates, anticipated demand for each type of health professional, and the cost of educational training. Recommendations concerning health occupations educational programs are included. A chart indicates Ohio schools offering public accredited and nonaccredited allied health education programs. In addition, maps show the locations (by county) of specific allied health programs, as well as emergency medicine and nursing programs. Data are also provided on: allied health programs by field and degree, including number of programs, enrollments, graduates, and placements; trends in the number of dental school applicants, dental class size, and graduates for two Ohio institutions; the number of licensed dentists and the ratio of dentists to population; and the ages of Ohio nurses in full- and part-time jobs and the percent of licensed nurses. (SW)

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REPORT ON HEALTH MANPOWER AND PROGRAMS IN OHIO: PART TWO

ALLIED HEALTH, AREA HEALTH EDUCATION CENTERS, DENTISTRY, EMERGENCY MEDICAL SERVICES, NURSING, OPTOMETRY, PHARMACY, PODIATRY, AND VETERINARY MEDICINE

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The Ohio Board of Regents adopted this report and recommendations of the Chancellor on November 14, 1983.

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ALLIED HEALTH EDUCATION

INTRODUCTION

The allied health professions currently include nearly 200 occupational titles. Many of the allied health specialties are relatively new additions and reflect the influence of rapidly evolving technologies and medical practice patterns. The process involved in the development of allied health programs and the preparation of allied health students are both complex and dynamic. Yet, in spite of the diversity and abundance of specialities within the allied health field, it remains similar to other health profession areas in many respects, including accreditation by professional, regional, and national organizations, the importance of clinical education, certification and licensure of graduates, and high cost of instruction. In addition, allied health fields reflect considerable variability in the education of students and qualifications for career preparation. For example, within the field of dietetics, a student may become a dietetic assistant upon completion of a three-month or twelve-month course of study, he may become a dietetic technician through a two-year associate degree program, or, he may become a registered dietician upon passing an examination administered at the completion of a baccalaureate or master's degree with a clinical internship. This variability of educational levels is found throughout the allied health areas.

While allied health encompasses a great number of occupational titles, this report will focus on nine major disciplines represented in Ohio: the dental auxiliary occupations, dietetics, laboratory technology, medical records, mental health, occupational therapy, physical therapy, radiologic technology and respiratory therapy. Table AH-1 represents the distribution of these major allied health education programs among the public institutions of higher education in Ohio. A number of private colleges, proprietary educational institutions and hospitals also conduct programs in allied health fields.

REVIEW PROCESS

Public, private and proprietary institutions that offer allied health education in Ohio were sent survey instruments by the Board of Regents' Office of Health Affairs in January, 1983. The survey requested current and projected information concerning the number, level, and location of educational programs offered, enrollments, graduates, accreditation status of programs, placement rate of graduates, applicant pool, and student performance on licensure examinations. Responses from approximately 100 institutions, describing more than 180 educational programs, were received.

Special Task Forces for each of the nine major allied health education disciplines were commissioned to review and analyze data gathered in the survey. These Task Forces employed the Ohio Consortium for Allied Health Education (OCAHE) manpower projection

model, revising assumptions inherent to the model for each discipline, to extrapolate current and future demand for the respective allied health professionals. Because there are a variety of approaches currently used to project demand, and no generally accepted standard, current assessments are speculative. An early conclusion reached by Task Force participants is that every effort should be taken subsequently to establish a more comprehensive database for analysis, and to formulate an adequate projection model for demand in the allied health fields.

The Board of Regents' Allied Health Advisory Committee reviewed and discussed the analyses and recommendations of each Task Force, and advised the Office of Health Affairs of its own observations in these matters. The Office of Health Affairs wishes to express its appreciation to the many individuals who contributed to its review of allied health education, through the Task Forces and the Allied Health Advisory Committee.

ASPECTS OF ALLIED HEALTH EDUCATIONAL PROGRAMS

The survey data compiled by the Office of Health Affairs describes 186 of the more than 200 allied health education programs currently offered in Ohio. Information reported in Table AH-2 indicates the aggregated number, level, and accreditation status of the allied health programs currently conducted by Ohio's public and private colleges and universities, as well as information on number of students enrolled, annual graduates, and placement records of those institutions responding to the survey.

From the descriptive survey data, it is clear that the preponderance of the programs reviewed by the Task Forces are accredited (75%), and are at the collegiate level (84 associate and 47 baccalaureate degree programs). Approximately 4,800 students are currently enrolled in the 186 programs surveyed. Most of these students are currently enrolled in the laboratory technology and the radiologic technology programs. The radiologic technologies include the largest number of noncollegiate programs in the occupational designations. Physical therapy and dietetics appear to be the most selective programs, on the basis of a comparison of their student admissions to total applications received. Favorable ratios for the number of graduates that pass professional qualifying examinations were reported in all fields. The data presented in Table AH-2 indicate high ratios for the number of graduates placed, particularly for dental hygiene and dental laboratory, physical therapy, radiologic technologies, and respiratory therapy. As Tables AH-2 and AH-3 indicate, the current demand for allied health graduates appears sufficient to justify programs now in operation. Task Force members identified dietetic assisting (certificate), dietetic technician (associate degree), medical laboratory technology (associate degree), physical therapy (baccalaureate degree), and physical therapist assisting (associate degree), as having demands not met by current numbers of graduates. These areas appear to warrant further program development.

SUPPLY OF GRADUATES AND ANTICIPATED DEMAND FOR ALLIED HEALTH PROFESSIONALS

Changes in the projected demand for various types and levels of allied health professionals will undoubtedly be influenced by anticipated developments in hospital reimbursement policies, especially by the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA).[1] Many of the educational costs which hospitals recover through third party reimbursement may have to be paid for in the near future by other means. Because of financial constraints, hospitals may be forced to revise their staffing requirements and to reduce their commitments in health education programs. Changes in reimbursement policies combined with a projected decrease in the number of eighteen to twenty-two year olds (the age range of most full-time college students) may cause potential areas of oversupply to correct themselves.

Future demand was determined for descriptive purposes by means of the OCAHE Project model, which considers the number of allied health professionals currently employed, changes in demand for health care due to the changing age of the population, and separation, mobility and retention rates for the respective professional fields, in addition to survey data currently available. Table AH-3, which describes estimated current and projected allied health manpower needs, was produced to give a representation of manpower recommendations made by members of the allied health Task Forces and the Allied Health Advisory

Committee. A modified OCAHE formula was used to determine the average number of graduates needed to reach the 1985 projected level, given current and desired levels of practitioner-to-population ratios. The numbers representing 1982 annual graduates reflect information only from the 181 reporting schools. Table AH-2 provides information about the relationship of the number of programs reporting in relationship to the number of programs in Ohio. The information does not adequately represent those institutions which did not respond to the survey, including most of the noncollegiate institutions. The desired practitioner-to-population ratios for 1982 were reported by OCAHE, and to date have not been affirmed by the respective professions. The projected practitioner-to-population ratios for 1985 were calculated using the OCAHE model and presumptive estimates for the annual number of graduates for 1983, 1984, and 1985, consistent with the recommendations of the Task Forces and the Advisory Committee.

Table AH-3 is intended to describe, not prescribe, what the outcomes of a manpower assessment would be, using the OCAHE model. It is descriptive in that (1) the 1982 annual graduates reported represents an incomplete set of data, (2) the 1982 practitioner-to-population ratios do not represent judgments by the respective professions of desired expressions of demand, and (3) the 1985 practitioner-topopulation ratios were derived mathematically from estimated annual graduates for 1983 and 1984, not determined at a desired level by the professions. Table AH-3 illustrates why a

more comprehensive data set is needed, as well as a rationale for future consideration by the allied health professions of assumptions inherent to the OCAHE model and similar manpower assessment approaches. Desired practitioner-to-population ratios for 1985 generally indicate a need to increase the number of graduates for the following disciplines by the percentages listed for the period 1982-1985:

Dietetics	
Assisting, Certificate	23%
Technology, Associate	13%
Laboratory Technicians	
Medical Laboratory Technician, Associate	13%
Physical Therapy	
Therapist Assisting, Associate	63%
Therapy, Baccalaureate	55%

For most of the other disciplines, the average annual number of graduates will generally satisfy future demand for respective allied health professionals. However, the Respiratory Therapy Task Force report predicted that if programs continue to graduate students at current rates, there may be an oversupply of both respiratory therapists and technicians by 1984.

Survey data summaries reported in Table AH-2 and statewide program distribution maps for each discipline show that current

allied health education programs are generally well located to serve prospective students regionally through certificate and associate degree programs and statewide through baccalaureate programs. Applicant pools and placement rates suggest strength of continued demand for most allied health graduates.

COST OF ALLIED HEALTH EDUCATION

In 1982, the State of Ohio provided more than $10 million in subsidy support for allied health education. By means of an enrollment driven model, public colleges and universities were subsidized for full-time-equivalent (FTE) students enrolled in approved associate and baccalaureate degree allied health programs. In 1982, there were 2,708 FTE students in associate degree programs with an average entitlement of $2,825 at the Technical III level and 797 FTE students in baccalaureate degree programs with an average entitlement of $3,765 at the Baccalaureate III level. Noncollegiate, nondegree, and private college enrollments in allied health programs were not subsidized.

Projected increases in 1985 enrollments for associate and baccalaureate degree programs offered at public institutions will have an impact on state support for allied health. More likely, the prospective impact of TEFRA and any change in the cooperative relationship between educational institutions and private health delivery institutions will have a more pronounced effect on increased public costs.

MAJOR ISSUES AND TRENDS

In reviewing information provided from each Allied Health Task Force, the Allied Health Advisory Committee identified a number of issues and trends which will influence the course of allied health in the state. Some of these issues are national in scope, some statewide, and some are institution-related.

- Maldistribution -- Although there are areas within Ohio that experience shortages of allied health professionals, these shortages, both temporary and chronic, may best be addressed by providing incentives to attract allied health professionals rather than by efforts to produce more allied health professionals or to encourage institutions to establish new allied health programs. Attempts to address maldistribution problems by adding new programs may create a serious oversupply of allied health professionals statewide, while failing to remedy the shortages of specific areas.

- Career Counseling and Program Articulation -- Students currently planning to enter the allied health professions are at times inadequately counseled. As a consequence, students take unnecessary pre-training for allied health programs, or take courses which do not meet career entrance standards set by various allied health professional organizations. Better counseling and earlier exposure to what allied health professionals do in their daily work will prevent students

from preparing for careers in which they later become dissatisfied. Students also encounter difficulty in making transitions from one level of career preparation to a higher level. For example, in moving, from the associate degree level of occupational therapy assisting to a baccalaureate degree program in occupational therapy, students may discover that the four-year institution does not give credit for some of their previous education, or may find that competition for very few positions in entry classes prevents them from advancing in their career. Other students who decide to shift from one allied health specialty to another may find that not as many course credits are transferable as they had anticipated. These situations are identified by educators as problems of articulation. Students could benefit from a clarification of entry requirements and practice responsibilities within allied health professions and among institutions. Professional organizations can assist in remedying these problems by developing criteria describing job entry level competencies expected of graduates of associate degree and baccalaureate degree programs.

- Cooperation Between Education and Service -- It is imperative that the partnership between health service agencies and educational institutions be strengthened so that both can meet the needs of high quality allied health services. Only

through close cooperation can educators be aware of needs both in the number of professionals to prepare and the specific skills that need to be taught.

- Consolidation of Allied Health Education within Collegiate Institutions -- Currently several high school and joint vocational school programs in the state offer training in selected allied health technologies. Members of the Allied Health Advisory Committee would call for a reexamination of such programs, especially in view of the increasing sophistication of these fields. It is noted that a Joint Commission of the Ohio Board of Regents and the State Board of Education is studying the question of program duplication between secondary education and the colleges, and is expected to address allied health technologies.

Members of the Committee also noted that in the past, hospitals often had no choice but to provide on-the-job training for their allied health staffs, or to sponsor formal hospital-based educational programs. Now that college-level programs are available in most allied health disciplines, they suggest, it would be desirable to limit the hospitals' role to that of serving as clinical sites for college-based programs. Programs currently hospital-based can become

clinical sites for college-based programs through affiliation agreements between institutions of higher education and hospitals.

The Office of Health Affairs notes that this suggestion parallels developments in the field of nursing, where, not many years ago, most instruction occurred under the auspices of the hospitals. As responsibility for instruction shifted to campuses, the hospitals have retained an essential role as clinical sites. The suggestion that similar changes occur in allied health fields is thus not without precedent, but warrants much further examination by policymakers.

- Accreditation and Licensure -- Finally, the Allied Health Advisory Committee called for reexamination of the proper roles of accreditation in assuring quality of programs, and of licensure in assuring competence of practitioners, without any needless duplication of effort. The Committee recommended that mental health technology programs seek approval according to recently developed criteria of Council for Standards in Human Service Education.

RECOMMENDATIONS

Three major recommendations are offered by the Chancellor, based upon the work of the Task Forces Allied Health Advisory Committee.

1. Appropriate institutions of higher education should be encouraged to establish certain new degree programs, including at least one new associate degree program in dietetic technology, at least two new associate degree programs in physical therapy assisting, in southern Ohio, and at least one baccalaureate degree program in physical therapy in southeastern Ohio. Distribution of currently existing programs in the state, projected manpower needs, as well as considerations of access for students, support this recommendation.

2. The state should promote and support institutional efforts to increase enrollments in existing programs in four areas:
    a. dietetic assisting and dietetic technology
    b. physical therapy assisting and physical therapy
    c. medical laboratory technology
    d. medical records.

    This recommendation is based in part upon observations of additional state manpower need for dietetics graduates over the next several years. Further, the physical therapy Task Force estimated need for additional physical therapists would increase by some 40% over the next 10 years. The medical laboratory Task Force forecasted a need for more than 500 medical technology graduates in 1983, a year in which only

300 actually graduated. Finally, the prospective impact of TEFRA and other developments suggest markedly increased need in the area of medical records.

3. State officials should otherwise proceed with caution in considering program expansion in other allied health areas, demanding that institutions assume added responsibility for demonstrating need for new programs and increased enrollments. This recommendation is offered primarily in view of the high state costs associated with allied health programs, and in view of the need to avoid unnecessary duplication of program efforts.

ADDITIONAL RECOMMENDATIONS OF THE ALLIED HEALTH ADVISORY COMMITTEE

While a number of recommendations were offered by the Task Forces concerning specific disciplines, the following arose from a consensus of members of the Allied Health Advisory Committee following thorough review of Task Force reports from the nine major allied health groups:

- Collegiate educational institutions should expand and extend their currently offered programs rather than seek the addition of new programs to address problems of undersupply and maldistribution of professionals within some of the allied health specialities. When changing technologies

suggest a need to create new occupational titles and offer new programs, these changing needs should cause a reconfiguration of existing programs rather than creation of new job titles and programs. The Chancellor concurs with this recommendation.

- Students should be counseled adequately about education requirements to prepare for entry and advancement within the allied health professions (especially in dietetics, occupational therapy and physical therapy). Educational institutions should assist students in progressing from certificate programs to two-year and four-year programs in allied health across the state. Educational institutions should also provide students with information concerning current placement rates for graduates entering allied health professions. The Chancellor concurs.

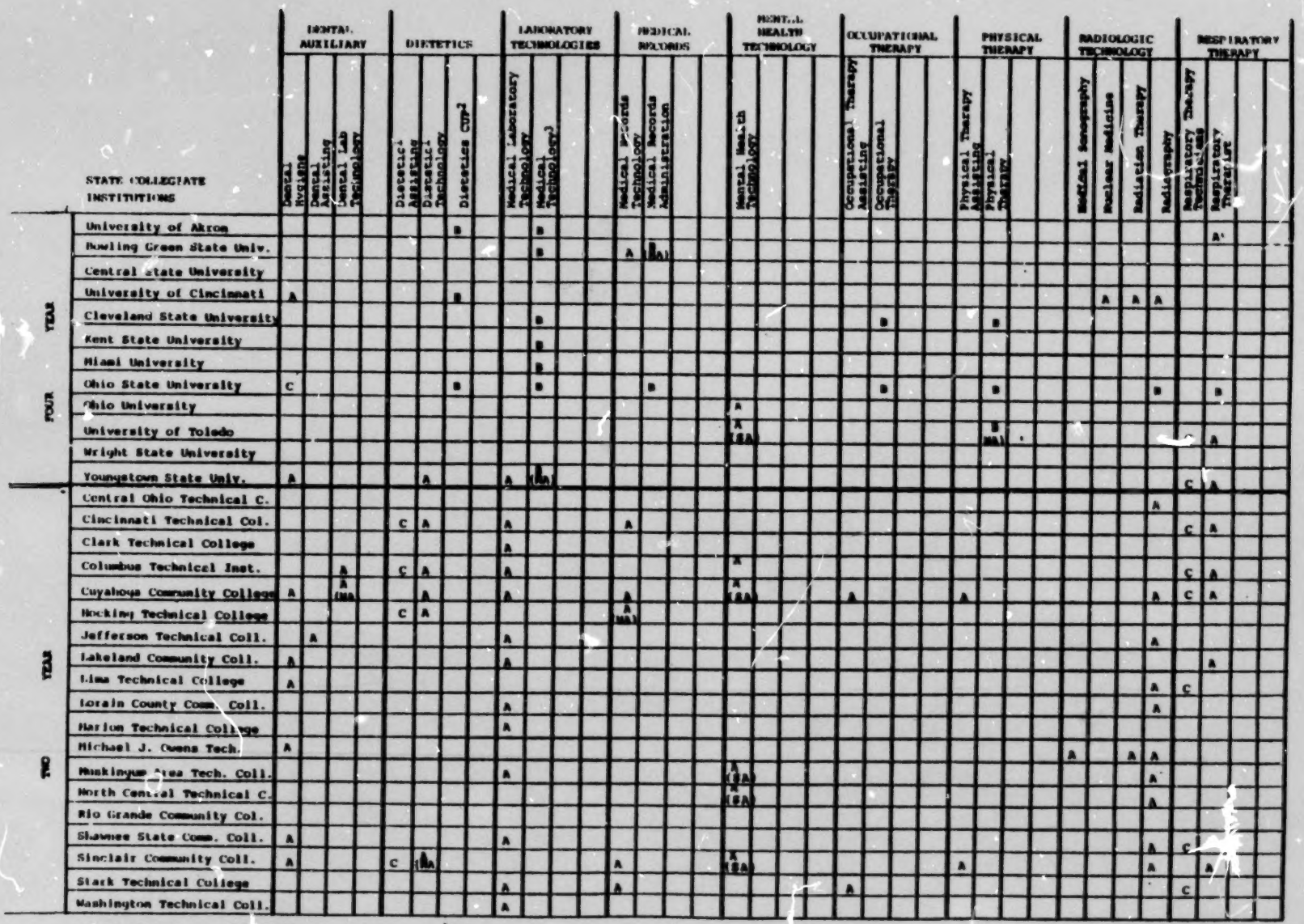
- Collegiate institutions should be encouraged to cooperate with hospitals and other organizations training and employing allied health professionals so that education can meet the need for high quality allied health services, with a minimum of duplication of effort. With this recommendation the Chancellor concurs.

- Allied health education should be offered only at the collegiate level. There should be no post-baccalaureate entry-level allied health programs.

  While there is little question of increasing sophistication in allied health fields, the Chancellor would urge further examination of the question of proper level of instruction in these fields, especially within the larger setting of secondary/postsecondary articulation in vocational and technical studies. On the question of master's-level professional entry degrees, in allied health fields, the Chancellor agrees that no such post-baccalaureate degree programs should be authorized in Ohio, at least until resolution occurs in the national debate on this issue.

- Allied health educators and practitioners should refine the manpower projection model developed by OCAHE, and/or should develop improved methods for forecasting state manpower needs in the allied health fields. A more comprehensive database, and more sensitive projection model will greatly benefit efforts in planning, developing and coordinating programs in the allied health fields. The Chancellor concurs, and offers the Regents' assistance in developing means of better understanding manpower needs in these important fields.

DISTRIBUTION OF PUBLIC ACCREDITED AND NONACCREDITED ALLIED HEALTH EDUCATION PROGRAMS



A = Associate
B = Baccalaureate
C = Certificate
D = Diploma
NA = Non-accredited
SA = Seeking Accreditation

[1]Approved rather than accredited
[2]Coordinated Undergraduate Program
HC Program phased out in 1982

[3]In affiliation with 36 hospital-based programs

TABLE AH-1

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DENTAL AUXILIARY EDUCATIONAL PROGRAMS

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DIETETICS EDUCATIONAL PROGRAMS

LABORATORY TECHNOLOGIES EDUCATIONAL PROGRAMS

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MEDICAL RECORDS EDUCATIONAL PROGRAMS

MENTAL HEALTH TECHNOLOGY
EDUCATIONAL PROGRAMS

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OCCUPATIONAL THERAPY EDUCATIONAL PROGRAMS

PHYSICAL THERAPY EDUCATIONAL PROGRAMS

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RADIOLOGIC TECHNOLOGY EDUCATIONAL PROGRAMS

RESPIRATORY THERAPY EDUCATIONAL PROGRAMS

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APPENDIX AH-3

ALLIED HEALTH EDUCATION PROGRAMS
1982

Program	Number of Programs	Programs & Enrollments			Graduates & Placements	
		Number of Programs Reporting	Number of Accredited Programs	Total # of Students Enrolled	Average Annual Graduates	Ratio of Placements to Graduates
Dental Auxiliary						
Dental Assisting, A.A.S.[1]	3	3	2	11	8	-
Dental Hygiene, Cert.	1	1	1	163	56	-
Dental Hygiene, A.A.S.	8	8	8	404	175	136/175
Dental Laboratory Technology, A.A.S.	3	3	1	55	28	27/28
Dietetics						
Assisting, Certificate[2]	9	6	6	103	61	59/61
Technology, A.A.S.	7	7	5	236	62	52/62
Baccalaureate, C.U.P.[3]	4	4	4	175	60	51/60[4]
Post-Baccalaureate Intern	9	8	8	31	61[5]	45/61
Laboratory Technologies						
Medical Laboratory Technology, A.A.S.	17	15	8	681	151	136/151
Medical Technology, Hospital-based Baccalaureate	36	25	19	149	162[5]	131/136
Medical Records						
Technology, A.A.S.	6	6	4	286	52	43/51
Administration, Baccalaureate	2	2	1	32	14	14/14
Mental Health Technology						
Associate Degree	7	6	2[6]	410	90	47/90
Occupational Therapy						
Assisting, Certificate	1	1	0	18	11	11/11
Assisting, A.A.S.	3	2	2	50	22	18/22
Baccalaureate	2	2	2	170	91	77/91
Physical Therapy						
Assisting, A.A.S.	3	3	3	83	46	46/46
Baccalaureate	4	3	2	226	97	97/97
Radiologic Technology						
Medical Sonography						
Certificate	3	3	0	8	5	5/5
A.A.S.	2	2	1	7	5	4/5
Nuclear Medicine						
Certificate	7	6	6	50	41	41/41
A.A.S.	1	1	1	10	6	6/6
Radiation Therapy						
Certificate	3	2	2	9	9	9/9
Associate	2	2	2	15	11	11/11
Radiography						
Certificate[7]	36	26	24	289	142	126/137
A.A.S.	14	12	9	381	144	127/144
Baccalaureate	2	2	2	39	15	15/15
Respiratory Therapy						
Certificate	12	10	7	235	163	162/163
A.A.S.	11	9	9	422	158	158/158
Baccalaureate	1	1	1	25	12	12/12

[1] Associate Degree in Applied Science
[2] Programs approved rather than accredited
[3] Coordinated Undergraduate Program
[4] UC program phased out in 1982
[5] Overlap of years and incomplete reporting accounts for several instances of more graduates than enrolled students
[6] Three programs are currently seeking accreditation
[7] Includes 4 diploma programs

TABLE AH-3

CURRENT AND PROJECTED ALLIED HEALTH MANPOWER NEEDS*

Occupation	1982 Annual Grads	PRACTITIONERS PER 100,000 POPULATION — Current Level	PRACTITIONERS PER 100,000 POPULATION — OCAHE Desired Level For 1982	PRACTITIONERS PER 100,000 POPULATION — 1985 Projected Level	Average # Annual Grads Needed To Reach Projected Level
Dental Hygiene	231	30	-	30	231
Dietetic Assisting	61	5	-	6	75
Dietetic Technology	62	8	-	9	70
Dietetics	121	18	-	18	121
Medical Lab Technology	151	16	13	20	170
Medical Technology	162	29	70	40	175
Medical Records Tech.	52	8	7	8	52
Medical Records Adm.	14	2	3	3	20
*Occupational Ther. Assisting	33	4	3	4	33
Occupational Therapy	91	8	9	8	91
Physical Ther. Assisting	46	6	4	7	75
Physical Therapy	97	20	13	25	150
Radiologic Technologies	206	54	74	54	206
Respiratory Therapy Tech.	163	11	15	11	160
Respiratory Therapy	170	10	7	7	165

*Developed from presumptive data used for the purpose of describing projected allied health manpower for 1983. See page 8 for explanation.

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AREA HEALTH EDUCATION CENTERS

The Ohio Area Health Education Centers program is organized to support efforts addressing maldistribution of primary care health professionals, the cost and quality of decentralized clinical and continuing education, and the need for health promotion activities within medically underserved areas of the state. It is a statewide educational program involving the collaborative efforts of Ohio's seven medical schools, a school of pharmacy, two dental schools, 12 nursing programs and 23 allied health professional programs. The Ohio Area Health Education Centers program includes 11 community centers, 34 schools and colleges, 48 programs serving 18 different health professions, and 354 academic faculty and community practitioners offering instruction at 176 community health service institutions. (See map, page 31).

The statewide program provides supervision for off-campus student clinical experiences, continuing education for local practitioners, academic support services, and community-based health education planning and program development. In 1981, the program provided primary care clinical rotations for 1603 undergraduate medical students, 669 nursing, 163 dental, 365 allied health, and 35 pharmacy students. More than 350 continuing education programs were offered through the Ohio Area Health Education Centers program to approximately 12,000 community health practitioners. Health career and promotional activities were conducted on a statewide basis.

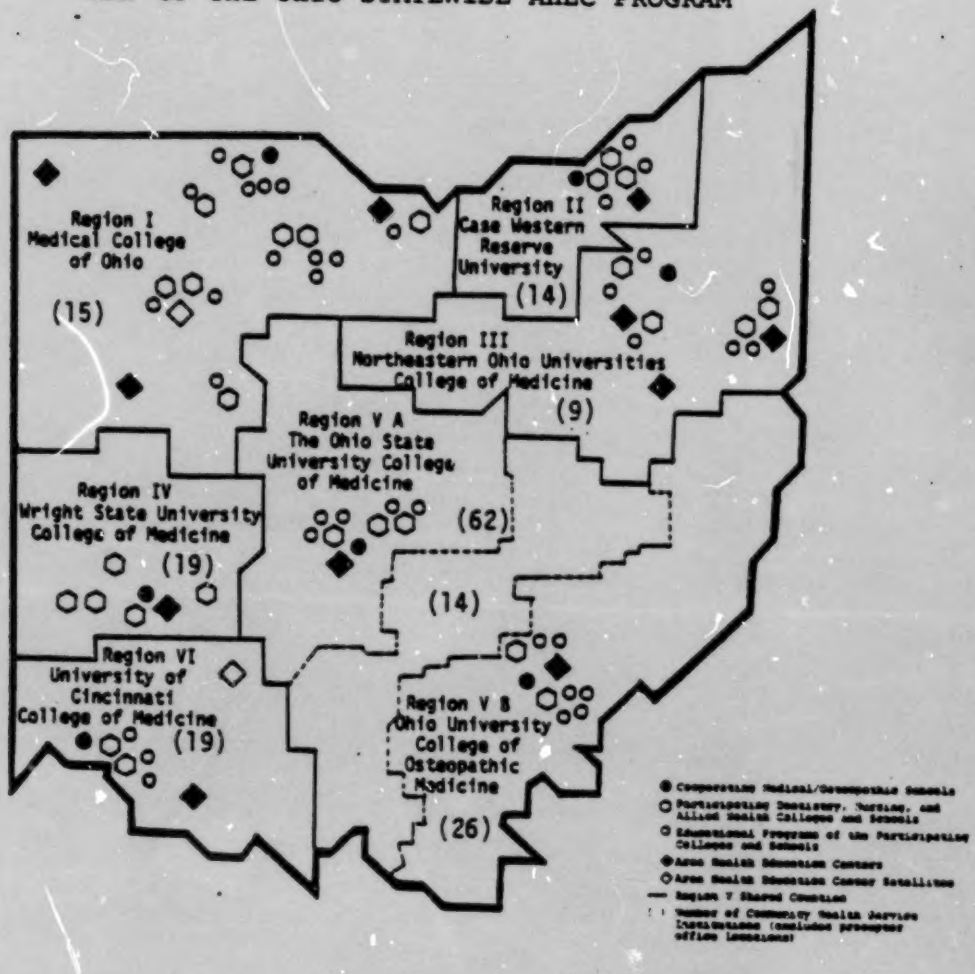
Through the Ohio AHEC program's educational activities, students now are better prepared and more likely to serve in remote areas, practitioners are less isolated, more currently informed, and are more effective in their practices.

Periodic evaluation of the Area Health Education Centers program is conducted by the federal government, which provides major funding for the program. Ohio continues to be a leader among the states in receiving very sizable shares of federal AHEC funding. While the program is yet in its infancy, and definitive evaluation premature, it remains the state's most tangible effort at resolving its problem of maldistribution of physicians.

RECOMMENDATION

The Chancellor's lone recommendation for the Area Health Education Centers program is for continued increasing state support for this important collaborative effort.

MAP OF THE OHIO STATEWIDE AHEC PROGRAM



REGIONS	MEDICAL SCHOOLS
Region I	Medical College of Ohio (MCO)
Region II	Case Western Reserve University (CWRU)
Region III	Northeastern Ohio Universities College of Medicine (NEOUCOM)
Region IV	Wright State University (WSU)
Region V	The Ohio State University (OSU)
Region V	Ohio University (OU)
Region VI	University of Cincinnati (UC)

AREA HEALTH EDUCATION CENTERS

Sandusky Area Health Education Center (SAHEC)
Lima Area Health Education Center (LAHEC)
Bryan Area Health Education Center (BAHEC)

Cleveland Urban Area Health Education Center (CUAHEC)

Mahoning-Shenango Area Health Education Network (MEAHEN)
Summit-Portage Area Health Education Network (SPAHEN)
Canton Area Regional Health Education Network (CAHEN)

Miami Valley Area Health Education Center (MVAHEC)

The Ohio State University Center for Health Professions (OSUCHP)

The Consortium for Health Education in Appalachic Ohio (CHEAO)

Health Education Alliance Through the University of Cincinnati (HEALTH-UC)

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DENTISTRY

INTRODUCTION

State subsidy support for dental education in Ohio is provided at The Ohio State University. In addition, the state contracts with Case Western Reserve University to take 60% of its entering class each year from Ohio residents. This contract began in 1969, and has been updated for each biennial period since then.

DENTAL MANPOWER

The numbers of applicants, enrollees and graduates in the two Ohio dental schools are given in Table D-1. A review of this data reveals several issues. There has been a significant decline in the in-state applicant pool at both institutions. According to the 1983 entry class data, it is not possible to fill all Ohio first year positions, since there were only 209 applicants for 220 positions. In order to fill the class with qualified applicants for the last two years, Ohio State has taken 13% to 15% of its entry class from the out-of-state applicant pool. Nationally, there has been a 10% decline per year in the number of applicants, so that the rate of applicants to positions has fallen from 1.2 to 1.[2] This situation raises significant questions concerning the quality of the applicant pool. Table D-2 gives the data from both The Ohio State University and Case Western Reserve University on their production of dental specialists for the year 1982.

Both schools are accredited by the American Dental Association Commission on Accreditation. The Ohio State University just underwent an accreditation site visit; the results of that review process have not yet been announced. Case Western Reserve University is scheduled for its next accreditation review in 1986.

DEMAND AND NEED

Although there continues to be significant need on the part of the state's population for dental care, this need is not being translated into an effective demand for dental services. Poor economic conditions, lack of dental insurance, and reduced governmental support for dental programs all have limited access to care. As can be seen in Table D-3, there are 5,772 licensed dentists residing in Ohio. Yet, there are still ten counties in the state with a dentist-to-population ratio of greater than 1:5,000, the federal criterion for underservice. There are three additional counties that are close to that figure. As with medicine, there appears to be a maldistribution of dentists between urban and rural practice settings.

Nationally, there is an overproduction of dentists, but current economic and other forces prevent dentists from establishing practices in the underserved areas. The cost of establishing a practice is substantial, and when that expense is

coupled with prior educational indebtedness, the recent graduate is not likely to seek an individual practice unless there is clear indication of adequate financial return.

The American Dental Association does not predict an increase in demand for dental services.[2] A significant decrease has occurred in the incidence of dental carries in children because of flouridation. On the other hand, adults are keeping their dentition into old age, requiring increased preventive, restorative and periodontic services. Expansion of employee dental benefit plans has exerted a positive impact on the demand for dental services. But those demand changes are small when compared to the rapid increase in the supply of practicing dentists.

FUNDING OF DENTAL EDUCATION

Case Western Reserve University received $1,559,800 in 1982 from the state in support of its program, while The Ohio State University received $6,493,490 as subsidy support. In the recently enacted appropriation bill for the 1984-85 biennium, Case Western Reserve University would receive $1.48 million each year, while The Ohio State University will receive $6.5 million and $7 million for the two years. Beginning in 1984, Ohio State will also receive approximately $480,000 per year to ensure adequate clinical experiences for its students.

ISSUES

The Office of Health Affairs identifies three major issues to be recognized in considering dentistry education in Ohio:

- The in-state applicant pool is of inadequate size to support the current number of Ohio positions at both schools.

- Stable funding of the College of Dentistry at The Ohio State University is needed to assure adequate faculty-to-student ratios and to enhance faculty quality.

- The effective demand for dental services continues to be depressed because of the state's incomplete economic recovery.

RECOMMENDATIONS

There is considerable similarity in manpower between dentistry and medicine in the state. In both, a forcasted over-production in the schools coexists with problems of maldistribution in the field. In both, these problems cannot be addressed by the Regents and the universities alone. Accordingly, the Chancellor recommends a state strategy similar to that proposed earlier this year by the Regents for medical education and manpower difficulties. That is, the Chancellor recommends that a new state agency, charged with responsibility for monitoring medical

manpower needs and issuing recommendations, also be charged with responsibility for monitoring such needs in dentistry, and for issuing recommendations to address those needs. As proposed in the Regents' "Report on Physician Manpower in Ohio," this state agency would be composed of representatives from the General Assembly, the Department of Health, appropriate licensing boards, the colleges of medicine and dentistry, the Board of Regents, labor, industry, other groups, and the public. It can be reported that discussion among state leaders is already underway concerning the formation of such an agency.

TABLE D-1

DENTAL STUDENT DATA

	1981	1982	1983
Case Western Reserve University			
Entry Class Size	104	103	102
Ohio residents	66	57	58
Applicants (total)	1826	1419	1077
Ohio	277	179	193
Graduates	99	92	87
Total Enrollment	393	392	414
Ohio State University			
Entry Class Size	163	163	161*
Ohio residents	140	141	139
Applicants (total)	1184	995	825
Ohio	284	241	209
Graduates	163	0**	189
Total Enrollment	499	647	613

* 150 new admissions, 11 repeating first year.

**Transition year from 3 to 4 year curriculum.

TABLE D-2

DENTAL SPECIALISTS 1982 - GRADUATES

	CWRU	OSU
Oral - Maxillo facial surgery	1	3
Pedodontics	2	3
Periodontology	3	4
Prosthodontics	-	5
Orthodontics	7	6
Endodontics	-	4
Oral Pathology	-	1

TABLE D-3

DENTAL MANPOWER - OHIO

	1970	1981	1982	% Change 1970-1982
Number of licensed D.D.S	4136	5609	5772	39.6%
Ratio D.D.S./Population	1:2576	1:1926	1:1871	(27.4%)
Counties = D.D.S./Population 1:5000	--	12	10	

EMERGENCY MEDICAL TECHNICIAN EDUCATION

In 1976, the Board of Regents was identified by legislative action as the agency in Ohio responsible for accreditation of Emergency Medical Technician-Paramedic (EMT-P) educational programs and recertification of these technicians. The Regents' responsibilities were extended by statute to include the Advanced Emergency Medical Technician-Ambulance (ADV EMT-A) program in 1979. This report details the current status of educational programs for the Advanced EMT-A's and Paramedics. It identifies future needs in this important health field and offers recommendations for improving the academic quality of existing programs.

EMERGENCY MEDICAL TECHNICIAN EDUCATION

Three levels of certification are currently recognized for Emergency Medical Technicians in the state:

- An Emergency Medical Technician-Ambulance (EMT-A) is an individual educated in the basic life support skills needed to provide emergency care for victims of acute illness or injury. The basic emergency medical technician training program in the State of Ohio complies with the federal Department of Transportation training guidelines and is approximately 110 hours in length. These educational programs are conducted under the direction of the Ohio

Department of Education. Currently, there are 50 accredited training programs recognized by the Department, and some 52,853 individuals have received certification at this level of training.

- At the Advanced Emergency Medical Technician-Ambulance level of preparation, the student's knowledge and skills are expanded to include the areas of patient assessment, shock and fluid therapy, airway maintenance, and intravenous therapy. The Advanced EMT-A program is approximately 25 hours of didactic education beyond the basic level training. Currently, 14 programs are accredited by the Ohio Board of Regents to provide this level of education. There are 3,868 Advanced EMT-A's certified in the state, with 4,955 certifications issued since the inception of the program in 1979.

- The Emergency Medical Technician-Paramedic is the third level of certification recognized for EMT's in the state. The content of this educational program exceeds that of the EMT-A and Advanced EMT-A programs through study of advanced life support technology, over a period of six months to a year of additional training. There are 31 such programs currently accredited by the Ohio Board of Regents to provide

this type of education. Since the beginning of this program in 1976, 5,962 individuals have been certified, with 4,353 currently maintaining certification.

In addition, an associate degree in emergency medical services is available from any one of six programs located throughout the state (Table EM-1). These programs provide the certified EMT-Paramedic with a greater depth of knowledge in areas such as anatomy and physiology, emergency medical services, management, and patient care. During 1982, there were 34 graduates statewide from this type of two-year educational program.

SUPPLY

Ohio's 31 accredited paramedic programs graduate approximately 786 paramedics a year who become certified. There are approximately 304 paramedics per year who do not recertify, resulting in an average annual net gain of approximately 482 paramedics. Projections for this annual rate of increase through 1985 suggest that approximately 5,800 paramedics will be available in the state.

Forecasting the supply of Advanced EMT-A's available in 1985 is more difficult, due to the relatively short history of this program in Ohio. The comparatively limited educational preparation necessary, progressively increasing enrollments, and

minimal continuing education requirements for recertification suggest that a rapid increase in recertifications will occur, and that there will be a high retention rate of those certified. In the aggregate, more than 7,000 Advanced EMT-A's should be available in 1985, which is more than double the current supply.

Delivery of prehospital care in Ohio is a role which has been assumed primarily by fire services. Information collected by the Department of Education indicates that in 1981 approximately 63% of the ambulance service ownership in the state was in the fire services. Private service constituted the second major portion of ownership, at 23%. These services should be able to provide excellent indication of need for additional certified individuals.

Another consideration affecting the availability of emergency medical technicians is the distribution of these individuals throughout the state. Table EM-3 indicates the number of Paramedics and Advanced EMT-A's in Ohio by county of residence. The distribution of these individuals is affected by employment practices of fire services, and also by the high degree of volunteerism involved in the delivery of prehospital care in the state. The employment practices of the fire services tend to hinder mobility of the Advanced EMT-A or Paramedic, since moving from one fire service system to another usually involves a loss of seniority and status within the fire service. Further, the high degree of volunteerism in the delivery of prehospital care, estimated at approximately 55% in the State of Ohio, creates a

situation in which individuals are reliant upon employment other than the emergency medical services, thus further limiting mobility as an emergency medical technician. In general there appears to be a strong relationship between the location of training programs and the distribution of the individual Advanced EMT-A's and Paramedics through the state. Counties which have training sites available, and contiguous counties, have a much higher incidence of these individuals than counties that are further removed from the educational programs. In summary, the supply of available Advanced EMT-A's and Paramedics appears adequate. The supply, however, is not evenly distributed throughout the state, and the relatively limited mobility of these individuals must be acknowledged.

DEMAND

In order to evaluate demand for Advanced EMT-A's and Paramedics throughout the state, the emergency medical services office of the Board of Regents reviewed data available from the Ohio Board of Pharmacy. This information (Table EM-2) indicates that there are 60 counties in the State of Ohio which have prehospital care available with advanced life support capability in the delivery of prehospital care. Within these 60 counties, there is an average of 12 advanced life support vehicles staffed

by 53 emergency medical technicians/paramedics. A projection of the current utilization of paramedics encompassing all 88 counties would indicate a need for 4,700 active paramedics in Ohio.

Similarly, there are 34 counties in the State of Ohio which have intermedicate life support services available, utilizing an average of 5 vehicles per county, and staffed by approximately 18 Advanced EMT-A's. Projecting this utilization pattern through all 88 counties would indicate a need for only 1,584 Advanced EMT-A's throughout the state.

In calculating the demand for services it must be understood that the availability of funds sufficient to initiate and maintain advanced life support services is of great importance. Although a high degree of volunteerism exists, equipment and start-up costs tend to inhibit the development of advanced life support services, especially with declining federal support and limited local funds. Future demand for certified paramedics appears directly related to the availability of resources to initiate and maintain such services. Because of the current economic instability, little or no growth in services is expected to occur.

Demand for Advanced EMT-A training will be much greater in the future for two major reasons. First, establishing an intermediate life support service requires lower initial cost, equipment purchases, and training. Secondly, these types of training programs provide a significant enhancement to the individual's knowledge and skill level, with a relatively minimal amount of effort needed in order to complete the required

educational program. Although the apparent need for Advanced EMT-A's in the state is well below the current number certified, programs of this type are expected to expand significantly over the next few years.

QUALITY

In addition to the ongoing reviews conducted by the Ohio Board of Regents emergency medical services office, there are other monitors of the quality of paramedic training in the state. An example is the evaluation and accreditation of programs by the American Medical Association Committee on Allied Health Education and Accreditation (CAHEA). As of June 1, 1983, only one paramedic educational program in Ohio had applied for accreditation from CAHEA, and evaluation of that application has not been completed. Another method of external evaluation is comparison of scores from the National Registry of Medical Technicians examination. The examination process, currently utilized by 16 other states as a method of certification, has been taken by a few Ohio paramedics on a volunteer basis. Data from the National Registry of Medical Technicians indicates a 30% pass rate for Ohio EMT-Paramedics on this examination. Since a common syllabus is used by all paramedic educational programs, this showing suggests continued vigilance is necessary in program evaluation, and gives further support for the use of a common student examination rather than examinations developed by individual programs.

ISSUES

Several issues must be considered in projecting the needs for Advanced EMT-A and Paramedic education in the State of Ohio. Foremost should be the quality of the educational process and the capabilities of the graduates of these programs. There are two mechanisms available to promote quality and consistency in the educational process. One is the accreditation process, which is currently under revision by a task force of the Paramedic Advisory Committee of the Board of Regents. A second means is by a standardized examination. The first statewide standardized examination for paramedics in the State of Ohio was administered on July 12, 1983. This examination, although different from the National Registry of Emergency Medical Technicians' examination, does evaluate the individual's knowledge as outlined in the federal Department of Transportation standardized paramedic training curriculum.

Another issue is access to the Advanced EMT-A and Paramedic educational programs of the state. Currently, there is a maldistribution of paramedic training programs. Access to this type of program must be improved to help reduce non-educational costs to individuals. The volunteer seeking Advanced EMT-A or Paramedic education will benefit from improved distribution of training programs through reduction in travel time and time away from regular employment.

RECOMMENDATIONS

It is the recommendation of the Chancellor that:

1. The Advanced EMT-A educational programs (which are relatively inexpensive to establish and which provide a significant improvement in the level of patient care provided by these individuals) should be encouraged to expand in size and also increase in number. This will provide a relatively economical mechanism to improve the overall level of care available in the State of Ohio in the prehospital setting.

2. Paramedic educational programs should be encouraged strongly to seek accreditation from the American Medical Association Committee on Allied Health Education and Accreditation, as a means of further evaluation and demonstration of quality. This process should also be related to the Board of Regents' accreditation mechanism, recognizing the similarities between the evaluations and limiting the duplication of effort for those programs which have sought and achieved accreditation through the CAHEA process.

3. Rules governing paramedic educational program accreditation processes should be sensitive to the economic realities of conducting paramedic educational programs during periods of declining resources. This objective could be

accomplished through identification of regions for paramedic education and encouraging programs within those regions to combine efforts in meeting the needs of their regions.

TABLE EM-1

ACCREDITED EDUCATIONAL PROGRAMS

(24) P - Paramedic

(12) A - Advanced

(6) D - Asrociate Degree

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TABLE EM-2

DISTRIBUTION OF INTERMEDIATE AND ADVANCED LIFE SUPPORT SERVICES

April 1983

TABLE EM-3

DISTRIBUTION OF CERTIFIED ADVANCED EMT-A AND PARAMEDICS

TABLE 3

*Kentucky Counties (Part of Greater Cincinnati Standard Metropolitan Statistical Area)

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NURSING

INTRODUCTION

For the past several years, there has been in Ohio a well-publicized nursing shortage, especially in hospitals and nursing homes. Extensive recruiting efforts, as well as enhanced salaries and benefits, have improved this situation to the point that such groups as the Ohio Hospital Association now believe the problem is manageable. This report provides an examination of future supply and need for nurses, and offers recommendations for the number of nurses, produced in the schools of nursing, as well for strengthening the academic quality of the existing nursing education programs.

NURSING EDUCATION

There are four distinct types of nursing educational programs that prepare registered nurses (R.N.'s):

- Hospital-based nurse education programs are generally three academic years in duration and give a diploma to the student upon completion. Although these programs offer no degree, they are authorized by the Board of Regents and their students are eligible for Ohio Instructional Grants, just as in associate and baccalaureate degree nursing programs. At present, there are 28 active diploma nursing programs, but several are scheduled to close in the near future.

- Associate degree nursing (A.D.N.) programs are located at 28 community and technical colleges and branch campuses across the state. These programs are two academic years in length and are designed to provide the graduate with basic nurse preparation.

- Baccalaureate degree nursing (B.S.N.) programs are located at 21 public and private colleges and universities. Two educational tracks are available for individuals aspiring to the B.S.N. degree. The generic programs are the standard four-year curricula which provide students with exposure to the humanities and sciences, as well as nursing instruction. Completion programs are specifically designed for registered nurses who have completed an A.D.N. or diploma program, and who wish to complete the required humanities, sciences, and nursing coursework required for a B.S.N. degree. Currently, there are 12 generic programs in Ohio with the flexibility to provide advanced placement for R.N.'s, and 9 B.S.N. programs which are completion in nature only.

- The fourth type of registered nurse preparatory program is the Nursing Doctorate (N.D.) program offered by Case Western Reserve University. This unique clinical nursing educational

program confers the N.D. to a non-nursing baccalaureate-prepared individual upon completion of a three year professional curriculum.

In addition to the programs which prepare registered nurses, Ohio has 7 master's degree programs in nursing (M.S.N.), strategically located in each of the Regents' health manpower regions. These programs prepare nurses to be educators, clinical specialists, or supervisors and administrators in the health care delivery system.

Ohio also has available one traditional research-oriented Ph.D. program. This program, located at Case Western Reserve University, provides the master's-prepared nurse the only access in the state to traditional doctoral nursing study. Figure N-1 offers a map of Ohio indicating the location of programs by type of degree offered.

SUPPLY OF NURSES

There are three separate sources of nursing manpower that must be considered in estimating the future supply of nurses in Ohio. First, there is the current registered nurse workforce in the state, and on Table N-1 are data on the numbers of registered nurses participating in the workforce, as well as distribution by age of those nurses. In 1980, approximately 78% of the licensed

nurses, or 62,389, were actively employed in nursing. It is of interest that 3,348 working nurses are over the age of sixty. Table N-2 offers a list of 25 counties where 11% or more of the workforce is of this age.

Data from the Inventory of Registered Nurses [3] indicates there was an average attrition rate in Ohio of 2½% for the last five years. Accordingly, about 2,000 nurses must be replaced each year in order to maintain the same supply.

The major source of new nurses for employment is the state's nursing education programs. In 1982, there were 3,776 graduates, (Table N-3) and a total enrollment of 15,384 students, while in 1983 (Table N-4), the total enrollment declined to 13,552, with diploma and A.D.N. programs decreasing and B.S.N. programs showing a small increase in student enrollment.

Immigration of nurses to Ohio is the third source of manpower. Data in the Inventory of Registered Nurses indicates that the State of Ohio licenses by endorsement about 1,600 nurses per year from other states.

Table N-5 presents a series of sequential calculations, starting with the 1981 nurse workforce number of 79,680 individuals, and for each year, adding those individuals with new licenses (examination and endorsement) and subtracting those lost by attrition. As can be seen, in 1984 there would be 90,303 nurses and in 1986, 96,949. If the 78% participation rate continues, there will be 76,000 nurses employed in Ohio in 1986.

Table N-6 represents data on number of students enrolled in the M.S.N. programs and their graduates. Table N-7 displays those universities offering M.S.N. programs. Though the number of master's graduates per year is relatively constant at about 130, the total number of students enrolled in such programs is increasing. This suggests that there are more part-time students who may take three to five years to finish the sequence. The vast majority of graduates with M.S.N. degrees have focused their attention toward teaching, nursing administration or clinical nurse specialties. Although many individuals with the M.S.N. pursue an academic career, the significant difference in financial compensation for those in clinical positions when compared to academia makes it difficult to fill academic positions.

In 1982, there were 39 students enrolled in the Ph.D. program at Case Western Reserve University. Three to four students complete this program each year. Expansion and further development of this program are planned by the university.

NEED

Determining a state's need or requirement for nurses is difficult, since nurses tend to move frequently between employers and also to leave and reenter the workforce similarly. Further, a significant number of nurses work on a part-time basis. The Office of Health Affairs has not attempted to model and independently determine the state's needs for nursing manpower.

Rather, data and recommendations from the Ohio Council on Nursing Needs and Resources [4] have been reviewed and analyzed, as have studies performed for the Ohio Hospital Association [5] and the Institute of Medicine. [6]

In 1978, the Ohio Council on Nursing Needs and Resources initiated a project designed to develop and implement a state master plan for nursing. The Council adopted the Western Interstate Commission for Higher Education (WICHE) model, with modifications, to project the state's needs. This model requires a panel of experts to evaluate and recommend nurse staffing patterns and utilization of nursing personnel at a number of stages in the model. In its 1981 Master Plan for Nursing, the Council recommended, as a projected lower bound estimate, a requirement of 86,006 full-time equivalent nurses to meet the needs of the state's hospitals, nursing homes, doctor's offices and home health agencies in 1985. [4] Because the WICHE model has been used by seven other states in statewide planning, a survey was made of their staffing assumptions, as well as the assumptions used by WICHE when the model was developed. [7] On Table N-8 is a comparison of the number of nurses needed, employing each expert group's assumptions, over Ohio's population. As can be seen, the lowest number of nurses needed is 61,223, using the original expert panel's assumptions, and the highest is 86,006 using the assumptions of the nursing Master Plan of 1981. These assumptions

were made by the panels before the current emphases on cost containment began, and in certain circumstances, represent an idealized circumstance.

A recently completed study by the Institute of Medicine entitled "Nursing and Nursing Education: Public Policies and Private Actions," concluded that the national nursing shortage has virtually disappeared. [6] Similarly, a series of surveys conducted by Ernst and Whinney, Inc., for the Ohio Hospital Association, [5] indicates that from 1978 through 1981, the percentage of unfilled budgeted positions for registered nurses in Ohio hospitals remained approximately 7.8%. By 1982, however, this percentage of unfilled budgeted positions dramatically decreased to 4.6%, as shown on Figure N-2. In many communities, there are no vacant positions available, and hospitals have developed waiting lists for any vacancies that may develop.

A comparison of the projected number of registered nurses per year, as found on Table N-5, with the number of nurses needed, as shown on Table N-8, suggests there will be enough total nurses available to meet projected needs, as defined by the average of the other seven states employing the WICHE model, but insufficient by the Ohio expert panel. Since the survey by Ernst and Whinney for the Ohio Hospital Association failed to reveal acute shortages, and since in many communities nurses are unable to find hospital employment, it appears likely that there is now a

relative balance between need and supply. It must be recognized, however, that the skills of nurses vary, and that vacancies may exist because individuals with desired levels of training and skills are not available.

Although the total nurse supply appears to be adequate to meet the state's needs, an increase in the number of nurses with master's and doctoral degrees in nursing is extremely desirable. This suggestion of need for the M.S.N.- and Ph.D.-educated nurse is consistent with a recommendation outlined in the Institute of Medicine report, and the Nurse Master Plan of 1981.

In 1982, the Ohio Board of Regents distributed more than $17 million to state-supported university and colleges in support of nurse education programs. As with other health programs, nurse education is expensive and requires high faculty-to-student ratios, as well as clinical settings. Nevertheless, if the downward trend in enrollment in A.D.N. and diploma programs continues, the vacancy rate in hospitals could again rise, as it might in addition when the economy fully recovers and the current high nurse participation rate drops. Continued high production of R.N.'s should continue for a few years or shortages will return.

It should be noted that the Ohio Board of Regents Health Region 2 (Cuyahoga, Lorain, Medina, Lake, and Geauga counties) includes only one B.S.N., two A.D.N., and nine diploma programs.

This region could easily accommodate one or two more B.S.N. programs to meet the diverse and intense nursing needs of the Cleveland metropolitan area.

ISSUES AND PROBLEMS

The Office of Health Affairs has identified three distinct quality issues associated with current nursing education:

- As part of the review conducted for this report, a survey was made of nursing faculty academic preparation, turnover rates, and recruitment issues. Table N-9 represents findings on faculty academic preparation by type of nursing program. Of the 1,527 total faculty members, only 5% have Ph.D.'s, E.Ed.'s, or D.N.S.'s. Forty-three percent have master's preparation with a nursing focus, while 14% have a non-nursing master's degree, and 13% a B.S.N. with coursework towards a M.S.N.

  A review of the biographic sheets submitted by each faculty member revealed that those individuals with a B.S.N. are likely in time to obtain an M.S.N. degree, if such a program is geographically close and will accept part-time students. Upgrading the academic preparation of current faculty, rather than recruitment of new individuals, is the most plausible method of improving the quality of most nursing departments.

Competition for nurse educators with the Ph.D. is intense and requires a salary and benefit package beyond the present means of most Ohio nursing schools.

- Most hospitals have developed extensive orientation programs for recent nurse graduates to prepare them to assume staff positions in nursing services. The amount of additional clinical education required varies according to the patient care unit and can be as long as four to five months for an operating room scrub nurse.

  At present, nursing is a major health profession that does not have a recognized postgraduate clinical experience prior to employment. In reality, there is such a period, but it is not uniform across nursing and varies by institution. Orientation programs are expensive and contribute to the ever increasing health care costs. A uniform training period with somewhat similar experiences for all may stabilize this situation and assist recent graduates in their transition from education to employment.

- Within the last year, three well established diploma nurse education programs closed or stopped admitting students. Continued funding of diploma programs is problematic, as medical care cost controls are implemented and hospitals have

to assume responsibility for unfunded diploma programs. Though Medicare will continue to allow a pass-through for educational costs, many feel that policy too will be changed in the near future. If a significant number of diploma programs close in the near future, concerted efforts by the A.D.N. and B.S.N. programs will be required to maintain an adequate flow of new nurses. In particular, the Office of Health Affairs staff observes that among baccalaureate programs, it is the generic variety of program which chiefly provides for the supply of new nurses in the state.

- Need for both generic and completion baccalaureate programs continues in the state. During the past several years, the Board of Regents has observed steady upgrading in the quality of completion programs, as well as increasing flexibility with respect to access and upward mobility in generic programs. While the Chancellor and Health Affairs staff perceive superior academic strength within generic programs, they nonetheless continue to recognize important and continued need for baccalaureate education opportunities for R.N.'s who hold diplomas or associate degrees. While the situation is progressing, continued attention to matters of academic strength and of access is warranted. Of special importance is the question of improved articulation among diploma, associate and baccalaureate level programs in the state.

RECOMMENDATIONS

The Chancellor offers the following recommendations for nurse education:

1. Enrollments in programs that prepare R.N.'s must continue at current levels. There appear to be a sufficient number of A.D.N. and B.S.N. programs, but where possible, increase in student enrollment should be considered by the institutions.

2. Alternative plans must be developed by state-supported A.D.N. and B.S.N. programs to expand enrollments if a significant number of diploma programs should close.

3. B.S.N. programs, whether of completion or generic nature, must continue to address issues of academic rigor as well as access for non-baccalaureate R.N.'s. Increased efforts by nursing educators at refining articulation among diploma, associate and baccalaureate programs in nursing should be supported.

4. In order to strengthen the academic preparation of current nurse education faculty, greater access is required to the seven M.S.N. programs. This may require additional positions, or making graduate education opportunities more accessible to these faculty members -- but without sacrificing quality of the graduate education experience.

5. Improved access to Ph.D. nurse education is necessary to assure the future supply of high quality faculty in the field of nursing in Ohio. To reach this objective, the feasibility of a state-supported Ph.D. nurse education opportunity should be explored.

6. Discrepancies in the role expectations and role actualities for recently graduating R.N.'s should be explored to lessen the student-to-employee transition shock. A joint education-employees demonstration project should be undertaken to develop the specifics of such a program. This type of program should focus on various methods of more efficiently and more readily adapting the recent graduate's preparation and capabilities to the workplace.

FIGURE 1

NURSING EDUCATION PROGRAMS IN OHIO

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TABLE N-1

STATEWIDE PARTICIPATION IN NURSING WORK FORCE BY AGE
1980-81 INVENTORY OF
REGISTERED NURSES AND LICENSED PRACTICAL NURSES

REGISTERED NURSES

TOTAL LICENSED	79,680	(Included are out-of-state residents employed in-state)
EMPLOYED IN NURSING		
FULL-TIME	50.2%	
PART-TIME	28.1%	
NOT EMPLOYED IN NURSING	17.6%	
NOT REPORTED	4.2%	

	Age 18-29	Age 30-39	Age 40-49	Age 50-59	60+	Age Not Reported
PERCENT IN FT NURSING	71.1	44.2	48.6	52.2	29.3	11.1
PERCENT IN PT NURSING	22.4	37.8	31.4	25.5	20.8	5.7
PERCENT NOT EMPLOYED IN NURSING	6.4	17.7	19.3	21.4	44.7	6.3
PERCENT NOT REPORTED	0.1	0.3	0.6	0.9	5.2	76.8
TOTAL NUMBER	12,635	22,622	15,390	11,759	6,772	3,498
PERCENTAGE OF THOSE LICENSED	24.6	28.4	19.3	14.8	8.5	4.4
PERCENTAGE OF THOSE EMPLOYED IN NURSING	29.2	29.7	19.9	14.8	5.5	

TABLE N-2

OHIO COUNTIES IN WHICH R.N.'s 60 YEARS OLD AND OLDER
EXCEED 11 PERCENT OF THE ACTIVE NURSING WORKFORCE

	Number	% of Active Workforce
ALLEN	108	11.4%
ASHLAND	37	12.5%
ASHTABULA	84	12.6%
CLINTON	21	11.7%
COLUMBIANA	80	11.7%
COSHOCTON	38	19.8%
CRAWFORD	43	13.4%
DARKE	27	11.1%
HANCOCK	48	11.6%
HARDIN	22	11.9%
HENRY	22	11.9%
HOCKING	9	11.4%
HURON	50	17.2%
KNOX	34	12.4%
LOGAN	29	12.7%
MEIGS	14	13.5%
MORGAN	9	16.4%
MORROW	17	11.7%
NOBLE	8	16.0%
OTTAWA	30	11.5%
PIKE	12	15.4%
SANDUSKY	58	15.2%
SENECA	42	11.4%
VAN WERT	27	11.6%
WILLIAMS	21	12.8%

Compiled from the 1980-81 Nurse Inventory

NUMBER R.N.'s 60+ YEARS CURRENTLY EMPLOYED IN NURSING		
STATEWIDE	3,348	5.5%

TABLE N-3

NURSE EDUCATION PROGRAM REVIEW
STATE SUMMARY OF 1982
STUDENT DATA FOR
DIPLOMA, ADN AND BSN PROGRAMS

	DIPLOMA	ADN	BSN	TOTAL
MAXIMUM NUMBER OF POSITIONS	2,864	2,982	2,120	7,966
NUMBER OF APPLICANTS	6,492	7,236	3,081	16,809
NUMBER ENROLLED IN FIRST YEAR OF MAJOR	2,276	2,918	1,848	7,042
TOTAL NUMBER ENROLLED IN PROGRAM	5,409	5,091	4,884	15,384
NUMBER OF STUDENTS GRADUATING	1,221	1,499	1,156	3,776
AVERAGE RATE OF ATTRITION FOR LAST 5 YEARS IN %	28.28	21.30	11.11	
NUMBER OF PROGRAMS	29	27	21	

TABLE N-4

NURSE EDUCATION PROGRAM REVIEW
STATE SUMMARY OF 1983
STUDENT DATA FOR
DIPLOMA, ADN AND BSN PROGRAMS

	DIPLOMA	ADN	BSN	TOTAL
MAXIMUM NUMBER OF POSITIONS	2,660	3,092	2,166	7,918
NUMBER OF APPLICANTS	4,796	7,244	3,341	15,381
NUMBER ENROLLED IN FIRST YEAR OF MAJOR	1,956	2,213	2,049	6,218
TOTAL NUMBER ENROLLED IN PROGRAM	4,150	4,207	5,165	13,522
AVERAGE RATE OF ATTRITION FOR LAST 5 YEARS IN %	28.28	21.30	11.11	
NUMBER OF PROGRAMS	29	27	21	

TABLE N-5

SUPPLY OF REGISTERED NURSES THROUGH 1985

SUPPLY 1980-81	79,680 x 2.5%	=	1,992 attrition
	79,680		
	- 1,992		
	77,688		
	+ 5,623	=	(Supply from examination + endorsement)
	83,311		
SUPPLY 1981-82	83,311 x 2.5%	=	2,083 attrition
	- 2,083		
	81,228		
	+ 5,623		
	86,851		
SUPPLY 1982-83	86,851 x 2.5%	=	2,171 attrition
	- 2,171		
	84,680		
	+ 5,623		
	90,303		
SUPPLY 1983-84	90,303 x 2.5%	=	2,258 attrition
	- 2,258		
	88,045		
	+ 5,623		
	93,668		
SUPPLY 1984-85	93,668 x 2.5%	=	2,342 attrition
	- 2,342		
	91,326		
	+ 5,623		
	96,949		
SUPPLY 1985-86	96,949		

TABLE N-6

NURSE EDUCATION PROGRAM REVIEW
STATE SUMMARY OF STUDENT DATA FOR
MASTER OF NURSING PROGRAMS
1981-1984

	1981	1982	1983	1984
MAXIMUM NUMBER OF POSITIONS	372	450	492	517
NUMBER OF APPLICANTS	547	622	616	1,207
NUMBER ENROLLED IN FIRST YEAR OF MAJOR	308	365	360	379
TOTAL NUMBER ENROLLED IN PROGRAM	724	807	868	808
TOTAL NUMBER OF GRADUATES (ENDING JUNE 30)	133	134		
AVERAGE RATE OF ATTRITION FOR LAST 5 YEARS IN % IS	3.67			

NUMBER OF PROGRAMS (REPORTING 7)

TABLE N-7

PROGRAM LOCATIONS

MASTER'S (MSN)
(CODE M)

INSTITUTION	CITY
College of Nursing & Health, University of Cincinnati	Cincinnati
Wright State University	Dayton
Medical College of Ohio	Toledo
The Ohio State University	Columbus
The University of Akron	Akron
Kent State University	Kent
Case Western Reserve University (BSN Program closing 81)	Cleveland

TOTAL 7

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TABLE N-8

1985 PROJECTION FOR FTE R.N.'s

(Lower Board)

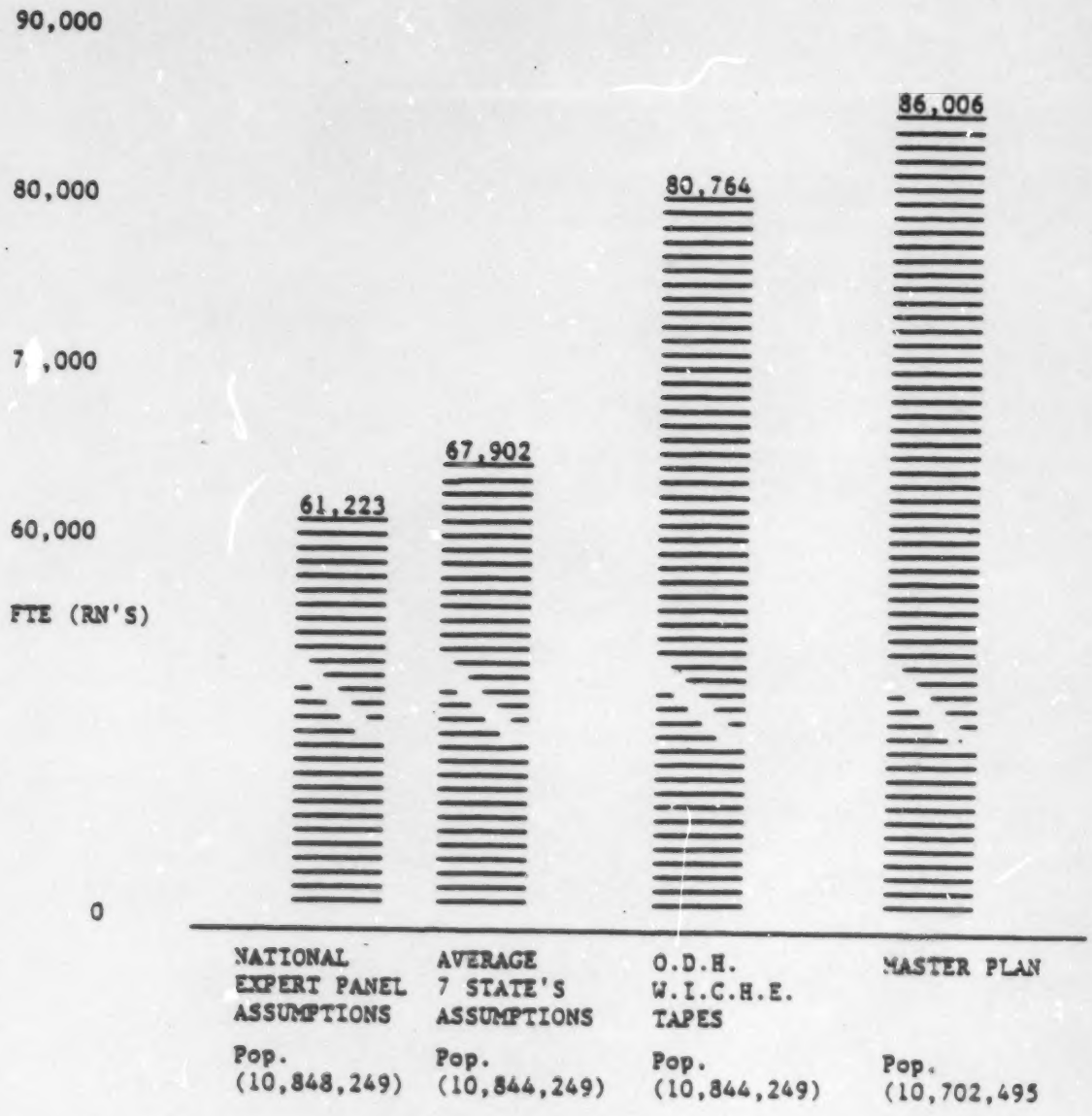

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TABLE N-9

NURSE EDUCATION PROGRAM REVIEW
STATE SUMMARY OF 1982-1983
NURSE FACULTY EDUCATIONAL PREPARATION
DIPLOMA, ADN, AND BSN PROGRAMS

Degree Held	Diploma	ADN	BSN	TOTAL	% of TOTAL
Diploma	43	16	0	59	4%
BSN	167	164	3	334	22%
BSN Plus Preparation for MSN	159	27	9	195	13%
Masters Preparation Non-Nursing Major	92	104	14	210	14%
Masters Preparation Nursing Major	208	99	350	657	43%
Ph.D., E.Ed. D.N.S.	6	7	59	72	5%
Total Faculty	675	417	435	1,527	

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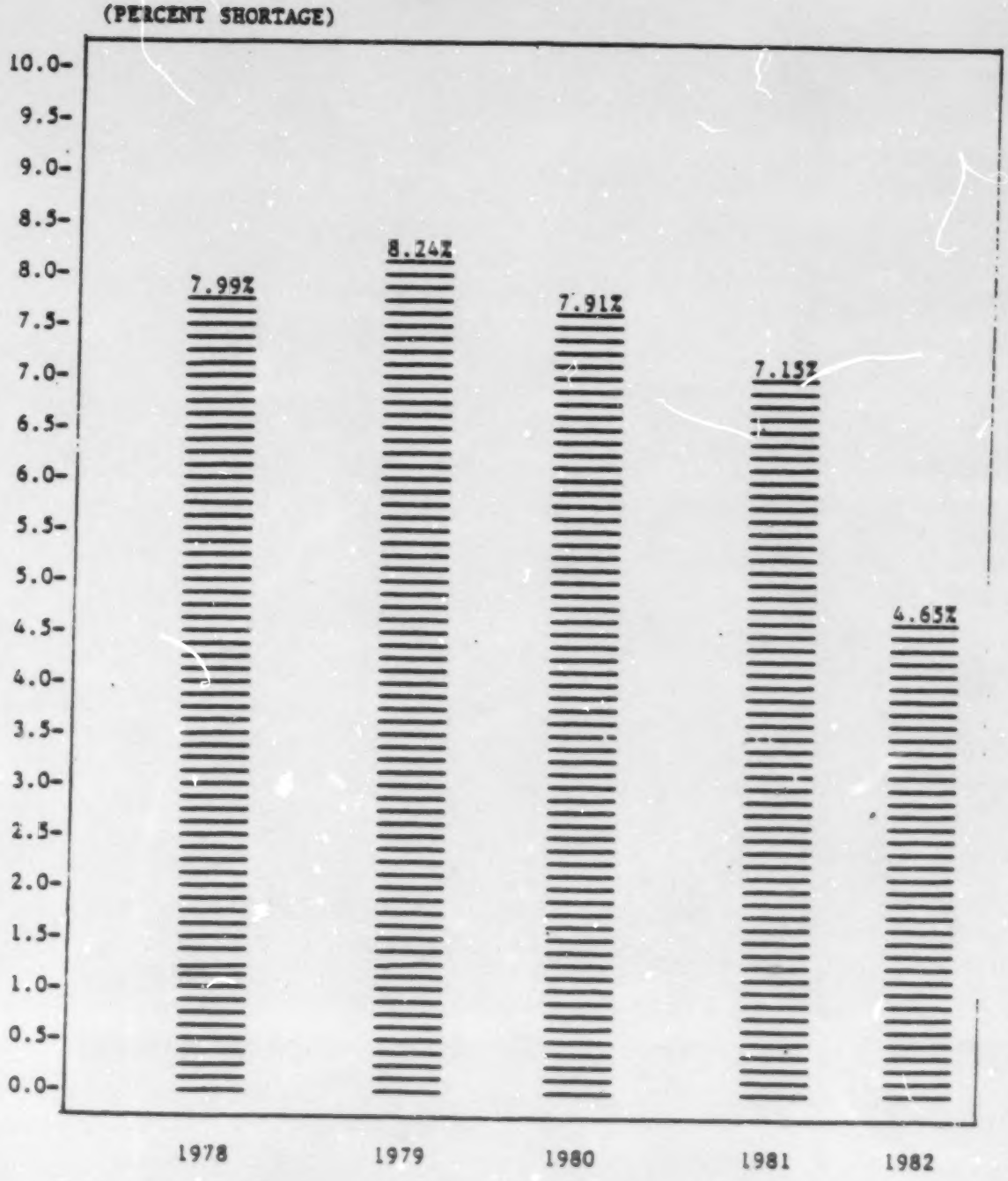
FIGURE N-2

UNFILLED BUDGETED VACANCIES
AS A PERCENT OF NURSING EMPLOYMENT
IN OHIO HOSPITALS. 1978-1982



RNS ONLY

OPTOMETRY

INTRODUCTION

Optometrists examine eyes for vision defects and other abnormal conditions, test depth and color perception, and when necessary, prescribe lenses and treatment. In the last few years, there has been an increase in the number of active optometrists in practice due to the expansion of enrollment in the professional schools. In states like Ohio which have a school of optometry, 80% to 90% of the graduates are retained in the state, and shortages of practitioners are most unlikely. Ohio reflects this finding by having a practitioner/population ratio higher than the national average.

A significant issue for optometry, both nationally and in Ohio, concerns the use of topical/pharmacologic agents to aid in diagnosis of disorders. Presently, optometrists in Ohio are legally forbidden from using such agents, though S.B. 187 of the 115th General Assembly has been introduced to amend existing statute and permit use of diagnostic agents.

OHIO EDUCATIONAL PROGRAM

The College of Optometry at The Ohio State University admits 60 students per year, with 10% of these students from out of state. In addition to the Doctor of Optometry (O.D.) students, there are also a master's program and a Ph.D. program in the vision sciences. Graduates from The Ohio State University school have performed well on licensing and board examinations.

The major research effort of the college is in contact lens practice, and that program is nationally very prominent. The college has 21 full-time and 42 part-time faculty and utilizes three major clinical teaching sites in Columbus. Recruitment of quality faculty and maintenance of research programs are two major issues facing the college, because of restricted financial subsidies. A decline in student enrollment in the Ph.D. program contributes to these two problems, as well as the significant income potential available to practitioners compared to that of educators.

RECOMMENDATIONS

The Chancellor offers no specific recommendations concerning optometry education.

PHARMACY

INTRODUCTION

In Ohio, changes in the practice of pharmacy reflect what is occurring nationally. Approximately 55% of all pharmacists work in the community, while 45% are employed by hospitals, nursing homes, units of government, schools or in the manufacturing sector. In the last ten years, the source of employment has shifted away from the independently-owned pharmacies to chain-owned stores and hospital-based pharmacies. Of the community-based pharmacists in Ohio, it is estimated that 70% work in chains and 30% in independent stores.

A second significant change in pharmacy practice is the rapid increase in the number of women as practitioners and students. Currently, 47% of pharmacy students and 30% of hospital-employed pharmacists are women. A recent study has shown that women pharmacists may have 70% of the productivity of their male counterpart because of part-time employment. [8] The impact of the increasing number of women pharmacists on the workforce is difficult to predict, but will become clearer since women now comprise almost 50% of the entry class.

The greatest potential manpower impact on professional practice is the declining size of the applicant pool for entry into pharmacy schools. As will be shown, difficulties in recruiting sufficient numbers of qualified applicants suggest schools should accept less than maximum class size.

PHARMACY EDUCATION

There are Colleges of Pharmacy at The Ohio State University, University of Cincinnati, The University of Toledo, and Ohio Northern University, an independent institution. Beside offering a bachelor's degree in pharmacy, all three state-assisted institutions offer a master's degree program, and the University of Cincinnati and The Ohio State University have both a Ph.D. program in pharmacy and a Doctor of Pharmacy (Pharm.D.) program. Table P-1 presents data on the aggregate numbers of undergraduate and graduate students by degree program. The anticipated increase in Pharm.D. students between 1983 and 1984 reflects the full implementation of a new program at The Ohio State University.

In the last few years, pharmacy education has redirected emphasis into greater clinical exposure for the student, at a time when colleges are faced with markedly reduced financial resources. This change is evident in the basic pharmacy curriculum and by the presence of a relatively new degree, the Doctor of Pharmacy (Pharm.D.) at the University of Cincinnati and The Ohio State University.

Nationwide, there is a decline in student enrollment in the schools of pharmacy which parallels a change in the number of individuals in the eighteen to twenty-two year old age group. In Ohio, the applicant pool has declined about 15% from 1982. Beside the decrease in population, the decline in applicants is also

attributed to the relatively noncompetitive status of salaries paid to pharmacists, particularly when compared to prospective earnings of graduates in engineering and business fields. Recently, starting salaries have increased somewhat, and this may assist in attracting more students into the profession.

In 1982, $3,917,500 was provided as subsidy support to the three state-assisted colleges of pharmacy. Approximately 76% of that subsidy amount was for baccalaureate programs, with the remainder for graduate program support.

All four colleges of pharmacy are accredited and are in good standing. Recent instabilities in state subsidy have made it very difficult to maintain desired faculty-to-student ratios, however. Over the last few years, each college has expanded and enhanced the student clinical experiences at a variety of practice sites. At present, the costs of these experiences are absorbed by the host institution, or a portion of costs is recovered by the colleges through in-kind services. As reimbursement mechanisms for hospitals and other health care providers change, it will become necessary for each college to fully fund these clinical experiences.

Recently, the American Council on Pharmacy Education has strongly advocated the Pharm.D. degree as the entry level professional practice degree. If the entry level degree becomes the Pharm.D., the implications of that change for pharmacy schools in Ohio are significant both in terms of increased need for clinical faculty and for training sites.

NEED

Projections of national need and supply of pharmacists are represented in Table P-2. As can be seen, nationally there may be an excess supply of pharmacists by 1990. Attempts were made to estimate the status of pharmacy manpower for Ohio, and these projections and the schools' production can be found on Table P-3. In making this estimate, a nationally-derived estimate of adequacy (a ratio of 67.7 pharmacists:100,000 population) was used to define an adequate provision of professionals, [8] and, as in other sections of this report, Ohio's population is projected to grow only 0.1% per year until 2000. Using this standard, Ohio needs 115 additional pharmacists in the year 1983 to meet the national figure of 67.7/100,000. Further, approximately 170 pharmacists are needed as replacements for those lost by death or retirement each year, while less than ten pharmacists per year are needed due to population growth. Using just the state-supported schools' output of 245 graduates in 1983, there appears to be a balance between need and supply, recognizing that chain drug stores may hire locally for positions in other states.

If 50% of the graduates are women, who, for whatever reason, work only 70% of the available time, then a 15% increase in graduates will be needed to maintain productivity level. This adjustment would raise graduates needed from 161 to 186 per year.

It is not possible at this time to estimate the need for master's, Ph.D., or Pharm.D.-prepared individuals. Nationally, there is a marked increase in the number of Pharm.D. and Ph.D. graduates, and this trend will continue at least for the near future to meet shortages in pharmacy administration and pharmaceutics in both educational and industrial settings.

CONCLUSIONS

An analysis of the demand and supply for pharmacists in Ohio strongly indicates there currently may be a surplus of pharmacists graduated when compared to need. Reducing the entry class size because of the possible surplus may be premature, both because of the declining pool of applicants and the high percentage of women graduates who may work less than full-time. Declining applicant pools may force a reduction in class size regardless of issues of supply and demand. Because of the five-year lead time entailed in pharmacy education, close yearly monitoring of the market for pharmacists' services and the volume and quality of the applicant pool will be necessary. Only qualified students should be admitted to the state's schools of pharmacy.

If significant alterations of third party reimbursement to hospitals should reduce available revenue, and payment for clinical experiences becomes necessary, additional state funding or significant reallocation of existing levels of funding of pharmacy education may be necessary.

The Chancellor offers no specific recommendations for pharmacy education in the state.

TABLE P-1

PHARMACY STUDENT DATA - OHIO

	1981	1982	1983	1984
Students				
Undergraduate[1]				
Entry Class Size	324	234	291	285
Total Enrollments	1,147	1,387	1,293	1,268
Graduates/year	379	404	350	365
Graduate				
M.S.[2]	20	20	29	36
Ph.D.[3]	14	9	14	23
Pharm.D.[3]	9	7	7	12

[1] The Ohio State University, University of Cincinnati, University of Toledo, Ohio Northern University

[2] The Ohio State University, University of Cincinnati, University of Toledo

[3] The Ohio State University, University of Cincinnati

TABLE P-2

NATIONAL NEED AND SUPPLY OF PHARMACISTS [8]

	Needs	Projected Supply Estimates		
		Concensus	Low	High
1980	144,200			
1990	166,200	172,500	169,400	176,400
2000	185,300	188,000	180,200	197,100

TABLE P-3

PROJECTED PHARMACY MANPOWER FOR OHIO

Data:	Current licensed pharmacists	= 7,200 or 66.6/100,000	
	Desired number of pharmacists	= 7,315 or 67.7/100,000	
	Ohio population increases	= 0.1% per year	
	Separation rate	2%/year	
	Desired number in 1983 - 7,315 - 7,200		= 115
	Number needed by 2000 because of population growth		= 147
	Number needed by 2000 because of death, retirement and withdrawal from workforce		= 2,487
	Total needed by year 2000 to maintain 67.7/100,000 ratio		= 2,750
	Yearly requirements		= 161

PODIATRY EDUCATION

INTRODUCTION

With approximately 8,900 practitioners in the United States (1980), podiatry is the smallest health profession. Five schools of podiatry graduate approximately 600 students each year nationally, a figure which generally approximates the number of podiatrists leaving the profession annually in recent years. [8] The five schools include New York College of Podiatric Medicine (New York City), Pennsylvania College of Podiatric Medicine (Philadelphia), California College of Podiatric Medicine (San Francisco), Illinois College of Podiatric Medicine (Chicago), and the Ohio College of Podiatric Medicine (Cleveland). A sixth school at the College of Osteopathic Medicine and Surgery (Des Moines) was established in 1982, with an initial class of 24 students.

OHIO COLLEGE OF PODIATRIC MEDICINE

The Ohio College of Podiatric Medicine (OCPM) is a private nonprofit educational corporation which was established in 1917 and which received a certificate of authorization from the Ohio Board of Regents for the Doctor of Podiatric Medicine degree program in 1969. It is accredited by the North Central Association and by the Council on Podiatry Education. OCPM has a current enrollment of 603 students, with a first-year class of 160. Approximately 240 full-time and part-time basic science residential and clinical adjunct faculty members are available to offer the Doctor of Podiatric Medicine degree program. The

curriculum for the Doctor of Podiatric Medicine requires four years of full-time study, currently including approximately 1,500 clock hours of academic instruction and 2,500 clock hours of supervised clinical rotations. To be admitted, a podiatry student must have successfully completed 90 semester hours of prerequisite baccalaureate courses. Of the 603 currently enrolled, 510 previously had received the bachelor's degree, according to OPCM's recent accreditation self-study.

SUPPLY AND DISTRIBUTION

Podiatry is a specialty profession providing diagnosis, treatment, and prevention of foot disorders. Other medical practitioners (i.e., general practitioners and orthopedic surgeons) provide similar podiatric services. Any consideration of the supply and distribution of podiatrists must be examined in that context.

Like other specialty professions, podiatrists tend to locate in urban counties with large populations and heavy demand for services. Nationally, the practitioner-to-population ratios among the states for podiatry is approximately triple for metropolitan counties what they are for nonmetropolitan counties. Approximately 90% of the podiatrists practicing in the U.S. (1980) serve metropolitan areas. [8]

In 1980, approximately 8,880 podiatrists were practicing in the nation, while in 1970, there were approximately 7,110 representing a 25% increase during the decade. The

podiatrists-to-population ratios for 1970 and 1980 were 3.4 (per 100,000) and 4.0 respectively. It is anticipated that this modest increase in supply will continue throughout the next decade. Concurrently, it is expected that general practitioners, especially in the underserved nonmetropolitan areas, as well as orthopedic surgeons, will continue to contribute significantly in providing foot care. Table PO-1 shows the practitioner-to-population ratio for the State of Ohio. Ohio's ratio is consistent with national trends and averages.

NUMBER OF GRADUATES

The number of graduates from schools of podiatry is affected more by the educational resources of the institutions than the apparent projected future demand for podiatrists. OCPM has established a desired maximum class enrollment of 160 students, and total maximum enrollment of 640. In 1982, its first year class was 160; the second year, 146; third, 150; and fourth, 147, for a total of 603. Limitations on the availability of basic science and clinical faculty, central campus laboratory facilities, and clinical rotations argue against any dramatic increase in the number of graduates at OPCM.

FUTURE ISSUES

OCPM has requested reauthorization by the Regents and is preparing an updated self study for a North Central accreditation

visit in April of 1984. Significant curricular changes and modifications involving administrative organization, student-to-faculty ratios, and clinical rotations will be reviewed for quality assurance.

Recent state support to OCPM will enable the institution to improve recruiting efforts both for students and high quality faculty. The prospective development of a podiatric medical assistant and technician program proposal for Regents' authorization, and subsequent regional and professional accreditation, is likely within a few years.

Efforts intended to reduce competition and accommodate greater collaboration between podiatry and other health professions should be a high priority.

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TABLE PO-1 [20]

Ratio of podiatrists (1974 and 1980), orthopedic surgeons (1979), and general and family practitioners (1979), to population, by region, division, and State

Geographic area	Podiatrists per 100,000 population		Physicians per 100,000 population (1979)	
	1974	1980	Orthopedic surgeons	General and family practitioners
United States	3.3	4.9	5.7	24.7
Northeast	5.8	8.0	6.1	20.9
New England	5.1	7.7	7.6	19.2
Connecticut	5.8	8.0	7.3	18.8
Maine	1.7	3.1	4.2	29.0
Massachusetts	5.9	8.5	8.1	16.6
New Hampshire	2.8	4.3	6.4	23.5
Rhode Island	5.7	6.5	6.7	20.4
Vermont	1.3	2.7	8.0	25.5
Middle Atlantic	6.0	8.2	5.6	21.5
New Jersey	4.5	7.3	5.7	18.7
New York	6.7	8.6	6.7	20.1
Pennsylvania	5.7	8.2	5.1	26.4
North Central	3.4	4.8	4.7	25.3
East North Central	4.0	5.6	4.6	23.8
Illinois	5.1	7.2	6.8	25.5
Indiana	2.4	3.5	3.9	31.5
Michigan	3.2	5.6	3.2	17.7
Ohio	4.7	5.5	4.8	22.5
Wisconsin	2.6	3.9	5.4	26.7
West North Central	1.9	3.0	4.9	28.9
Iowa	2.8	4.1	3.8	31.4
Kansas	1.7	2.9	5.0	30.8
Minnesota	1.8	2.3	6.3	37.2
Missouri	2.0	3.1	4.6	16.4
Nebraska	2.3	3.2	5.1	37.6
North Dakota	0.8	1.7	4.0	32.9
South Dakota	1.8	2.1	3.2	31.3
South	1.7	3.7	5.3	25.1
South Atlantic	2.1	4.0	5.4	23.6
Delaware	3.1	4.8	5.3	22.8
District of Columbia	7.0	13.4	9.1	20.3
Florida	3.0	6.7	7.1	27.5
Georgia	1.4	2.6	5.1	19.2
Maryland	3.2	5.3	3.2	20.0
North Carolina	1.0	1.6	5.2	22.8
South Carolina	0.6	1.3	4.8	29.7
Virginia	1.4	2.8	6.0	25.5
West Virginia	2.0	3.0	4.0	24.0
East South Central	0.8	1.6	4.6	23.0
Alabama	0.6	1.3	4.4	21.1
Kentucky	1.5	2.2	4.1	25.5
Mississippi	0.3	0.7	3.7	24.9
Tennessee	2.7	1.8	6.0	22.0
West South Central	1.5	2.5	5.1	24.7
Arkansas	1.0	1.4	4.4	32.0
Louisiana	0.9	1.7	5.8	21.0
Oklahoma	1.8	2.8	4.5	23.2
Texas	2.0	2.9	5.1	25.1
West Mountain	2.9	4.9	7.5	28.0
Arizona	2.6	4.7	8.2	29.1
Colorado	2.5	4.0	7.1	29.7
Idaho	1.8	2.8	5.7	31.6
Montana	2.0	2.4	5.9	29.5
Nevada	2.6	4.5	5.8	25.0
New Mexico	2.3	4.0	6.1	21.5
Utah	2.6	4.9	6.5	24.3
Wyoming	2.0	1.8	5.8	28.2
Pacific	3.1	5.2	7.8	30.1
Alaska	0.9	1.0	8.2	27.4
California	3.6	5.9	8.0	30.2
Hawaii	0.9	1.6	5.9	25.5
Oregon	1.5	2.9	8.4	28.7
Washington	1.8	3.5	6.6	31.4

Source: 1974 data for active podiatrists from National Center for Health Statistics; 1980 data for total podiatrists from American Podiatric Association. The 1980 data include podiatrists who applied for membership in the APA, both Federal and non-Federal, active and inactive. These data are considered less reliable than the 1974 figures.

VETERINARY MEDICINE

INTRODUCTION

Veterinarians provide a variety of services, including treatment of companion animals, herd maintenance and disease control, regulatory and public health functions, research and teaching. Veterinarians also contribute to human health in the prevention and control of animal-to-human transmitted diseases, food protection, environmental hazard prevention and control, and medical research.

The provision of trained veterinarians to treat large animals and companion animals is an important statewide objective. Because the demand for services is greatly influenced by the economy, unemployment levels and inflation, there continue to be sectors of the state with unmet needs. In the last three years, many veterinarians specializing in large animal practice either have left the state or have changed their sites of practice since farmers are foregoing veterinary services during this period of financial distress.

OHIO VETERINARY MEDICAL EDUCATION

Currently, the College of Veterinary Medicine at The Ohio State University graduates about 135 physicians per year. For an entry class size of 130 students per year at The Ohio State University College of Veterinary Medicine, Ohio residents have 100 positions, while 30 positions are filled by students from states that contract with The Ohio State University to provide veterinary

education to their citizens. There are approximately three qualified applicants for every available position in the entry class. The most recent passing rate of Ohio doctors of veterinary medicine taking the licensing exam is over 91%. Over the last five years, the average attrition rate is 1% per class.

The college owns and operates a 30,000 unit hospital and has a referral service area supplying small animal patients from an area extending from Louisville, Kentucky to Pittsburgh, Pennsylvania and from northwestern West Virginia to eastern Indiana. Over 85% of large animal patients are referred to the hospital by veterinarians in Ohio. The patient volume is the largest institutional practice in the United States, according to the College of Veterinary Medicine's 1980 self-study. In addition, the College has acquired a 130-acre farm for research and instruction concerning large animals.

Recently, the college had its accreditation status threatened because of faculty-to-student ratio difficulties. Significant actions were taken by The Ohio State University to correct the situation, and the Board of Regents approved increases to the Medical I instructional subsidy for Veterinary Medicine, as well as $400,000 in subsidy to support clinical instruction. In 1982, the college received $5,406,429 as subsidy support. In the recently enacted state budget bill, the legislature appropriated $6.1 million in 1984, and $6.5 million in 1985, for instructional subsidies, as well as $412,000 in 1984 and in 1985 for clinical support subsidies.

To provide high quality veterinary education, The Ohio State University College of Veterinary Medicine is investing its funds in obtaining facilities for research laboratories, gross anatomy teaching space, faculty offices, large animal holding space and isolation space, and a library complex.

SUPPLY AND NEEDS

In 1979, Ohio had a veterinarians-to-residents ratio of 13.7/100,000, and in 1983, that ratio has increased to 16.7/100,000. There are 1,798 licensed doctors of veterinary medicine with the following practice distribution: general practice - 29%; large animals - 6.8%; small animals - 42%; teaching - 1.9%; unknown - 1.6%; and miscellaneous (military, public employee, other, retired) - 8.7%. When comparisons are made among states, there is a direct relationship between the percentage of a state's land used for farming and the veterinary population ratio. Approximately 65% of Ohio's land is used for farming, which is 39% above the national average, while the veterinarians-to-residents ratio is only 10% above the national average. At present, there is no satisfactory method except supply and demand analysis to judge whether the current supply of services is adequate. According to a national study, over 40% of veterinary school graduates locate their first practice within the state of the school from which they graduated, and over 50% of all graduates return to their state of original residency for employment. [9]

SUMMARY OF FINDINGS

Though there is an overabundance of veterinarians nationally, by accepted professional-to-population standards, in Ohio there is probably a reasonable balance between supply and demand. Demand for veterinarians, especially for those treating large animals, should be greater, but will not increase until farmers experience more satisfactory financial returns. The applicant pool for veterinary medicine is currently sufficient, and additional state monies have been found to correct threatened accreditation difficulties.

The Chancellor offers no specific recommendations for veterinary medicine except continuation of monitoring of the dynamics of supply and demand in the state.

REFERENCES

1) Tax Equity and Fiscal Responsibility Act of 1982.

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4) Ohic Department of Health, Division of Nursing. Ohio Master Plan for Nursing, Columbus, Ohio. April 1981.

5) Weimer, William C. "The Nursing Shortage in Ohio," unpublished report to the Ohio Hospital Association.

6) Institute of Medicine, Division of Health Care Services. "Nursing and Nursing Education: Public Policies and Private Actions," National Academy Press, Washington, D.C., 1983.

7) Preliminary Report - "Comparison of the Rationale and Criteria for Staffing Developed by the National Panel of Expert Consultants with Those Developed by Panels of Eight States." Western Interstate Commission for Higher Education, Boulder, Colorado. February 1981.

8) Third Report to President and Congress: Status of Professions Personnel. DHHS Publication No. (HRA) 82-2, January 1982. 1 p. VIII-3.

9) Zeglen, Marie. "An Analysis of the Results of the 1981 Annual Survey of Graduating Veterinary Students of U.S. and Canadian Colleges. Journal of Veterinary Medicine Education, Vol. 9, pp. 11, 1982.

PREFACE

Among the powers and duties conferred upon the Ohio Board of Regents is the responsibility to conduct studies of state policy in the field of higher education, recommending to state government and to the institutions of the state those programmatic changes the Board believes desirable in view of the public interest. In 1982, the Board of Regents directed that a year long review of health manpower and programs in Ohio be conducted, and that a report on the status of these programs be submitted. The Regents' interest in health affairs reflects their recognition of the unquestionably vital role of the state's educational programs in the health fields in supporting health care services of the state. The Regents' interest also reflects their understanding of the high costs associated with educational programs in health fields, and of the direct link between these programs and state manpower needs.

In response to the Regents' charge, the Office of Health Affairs, under the direction of then Vice Chancellor Thomas A. Helmrath, assembled a number of task forces and advisory committees to contribute to this review, and to bring together the great variety of data bearing on health education issues. The review of health programs and manpower issues conducted by the Office of Health Affairs continued through the 1982-83 academic year, and resulted first in a preliminary report to the Board on physician manpower issues in April of 1983. That document,

"Report on physician manpower in Ohio: requirements, supply and cost," was subsequently adopted by the Board on July 15, 1983.

The present report treats health fields other than medicine, including allied health, the area health education centers program, dentistry, emergency medical services, nursing, optometry, pharmacy, podiatry, and veterinary medicine. A preliminary report of the Chancellor was presented to the Board of Regents in September 1983 and distributed to the public and to interested constituencies in the health and education fields. The Board of Regents welcomed and valued the observations of the public and of these constituencies prior to making final revisions to the report.

While this study is not without recommendations for the improvement of college and university health programs in the state, it recognizes that Ohio has by any measure a mature, responsive and high quality array of educational programs in the health fields. Reflecting the maturity of Ohio's system of higher education, the report recommends only a handful of new programs to improve the distribution of health services for the public as well as access for students. In most health fields there now appears to be a balance between supply and demand. In a few others, where an imbalance is suspected or threatened, careful monitoring and potential enrollment adjustments are recommended. A persistent concern throughout the report is that of the quality of instruction offered. Recommendations are offered on this subject, but it is noted that health programs in Ohio's colleges and

universities typically perform well above standards generally prevalent across the nation.

The report is organized into nine sections, corresponding to the major program fields reviewed. While each section's structure varies with its subject matter, each contains a basic description of the field under review, and discussion of manpower needs, costs, availability and quality of programs, current trends and issues, and recommendations of the Chancellor. Footnotes found throughout the text correspond to a section of references at the end of the document.

In many cases, in order to focus directly upon manpower and other issues of primary state-level interest, this document abstracts and generalizes from the observations of the many task forces and committees brought together to examine health education in the state. The Board of Regents wishes to record its appreciation to the many health educators who participated through those task forces and committees in the development of the report. Their expertise and commitment of time and energy have contributed greatly to this review of health programs in Ohio.